

2053. Information Gaps Among Patients Prescribed Antibiotics on Discharge to Nursing Homes

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Background. Antibiotic use in nursing homes (NHs) is frequently initiated in acute care hospitals. Comprehensive antibiotic administration instructions are critical to inform antimicrobial stewardship efforts in NHs. However, little is known about the quality of discharge communication for residents transitioning from hospitals to NHs with an antibiotic prescription.

Methods. We reviewed hospital discharge summaries from a 10% random sample of hospital-initiated antibiotic prescriptions among residents of 17 for-profit NHs in Oregon, California, and Nevada admitted between January 1 and December 31, 2017. Data elements of interest were documentation of antibiotic choice, indication, instructions, and pending microbiology tests.

Results. Among 217 hospital-initiated antibiotic prescriptions, mean (standard deviation) age was 64 (29) years and 57% were female. The most frequently prescribed hospital-initiated antibiotics were cephalosporins (36%), fluoroquinolones (16%), and penicillins (14%). Hospital discharge summaries were missing from 19% (42/217) of the resident medical records. Core antibiotic prescribing information was missing from 38% (67/175) of the medical records with a discharge summary: 11% (20/175) were missing all core elements, 23% (41/175) were missing the antibiotic indication, 27% (48/175) were missing antibiotic dose, 27% (48/175) were missing antibiotic frequency, and 32% (56/175) were missing antibiotic duration. Parenteral antibiotics were more frequently missing information compared with oral antibiotic prescriptions (45% vs. 37%, $P = 0.32$).

Conclusion. Information gaps around antibiotic prescriptions are prevalent in transfer documentation for NH residents admitted from acute care hospitals. Interventions are needed to improve the quality of information transferred from acute care hospitals to NHs.

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2054. Hospital-initiated Antibiotics in Nursing Homes

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Background. Nursing homes (NHs) are required by the Centers for Medicare and Medicaid Services to maintain antimicrobial stewardship programs. Hospital-initiated antibiotics may pose a barrier to optimizing antibiotic prescribing in this setting. Our objective was to characterize hospital-initiated antibiotic prescriptions among NH residents.

Methods. We collected electronic health record data on antibiotic prescribing events within 60 days of residents' admission to 17 for-profit NHs in Oregon, California, and Nevada between January 1, and December 31, 2017. We characterized antibiotics prescribed, administration route, and proportion initiated in a hospital setting.

Results. Over the one-year study period, there were 4350 antibiotic prescribing events among 1633 NH residents. Mean (standard deviation) age was 77 (12) years and 58% were female. Approximately 45% (1,973/4,350) of antibiotics prescribed within 60 days of NH admission were hospital-initiated. The most frequently prescribed hospital-initiated antibiotics were cephalosporins (27%; 1st gen: 54%, 2nd gen: 6%, 3rd gen: 34%, 4th gen: 5%, 5th gen: 1%), fluoroquinolones (20%), and penicillins (14%; natural penicillins: 4%, semisynthetic penicillins: 3%, aminopenicillans: 57%, β -lactam/ β -lactamase inhibitors: 21%, and antipseudomonal penicillins: 15%). Additionally, 24% of antibiotics were parenteral and the median (interquartile range) duration of therapy was 6 (3–10) days. Over 15% of residents with hospital-initiated antibiotics were readmitted to the hospital within 30 days.

Conclusion. Approximately 45% of antibiotic prescribing in a multistate sample of NHs were hospital-initiated, of which roughly 40% was broad-spectrum. Interventions specifically targeting antibiotic prescribing during and following the transition from hospitals to NHs are needed.

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2055. Action: A Year in the Lives of Consultant Pharmacists Working on Antimicrobial Stewardship in Long-Term Care Facilities

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Background. The CDC recommends consultant pharmacists (CP) support antimicrobial stewardship (AS) activities in long-term care facilities (LTCF) by reviewing antimicrobial appropriateness. We initiated a project training CP from a regional long-term care pharmacy to support AS implementation in LTCF.

Methods. CP were trained to evaluate the appropriateness of all systemic antimicrobial therapy (AT) and provide prescriber feedback during their monthly drug regimen review (DRR). An electronic database was developed to facilitate data reporting. Antimicrobial use (AU) and adverse events (AE) from 32 LTCF were analyzed for 2018 using descriptive statistics.

Results. A total of 5327 courses of AT with a median duration of 7 days (IQR 5–10) were reviewed. The majority of AT was started in the LTCF (55%) but was also initiated in hospitals (24%), clinics (11%) and emergency departments (2%). Of 2926 AT started in LTCF, 36% were based on nurse evaluation (NE) while 33% began after prescriber evaluation (PE). Fluoroquinolones (FQ) and first-generation cephalosporins were the most commonly prescribed agents (Table 1). Treatment or prophylaxis of urinary tract infections accounted for 40% of AU (Figure 1). Diagnostic testing was associated with 37% of AT courses. Urine cultures were the most frequent test performed (81%). Overall, 41% of AT was determined to be inappropriate resulting in > 800 feedback letters sent to prescribers. Unnecessary antibiotic starts (based on revised Mc Geer or Loeb's criteria) were identified as the most common reason (Figure 2). AT appropriateness varied depending on the setting in which it was initiated. A majority (87%) of AT initiated in hospitals was found to be appropriate with 56% and 46% appropriate for ED and clinic starts. Appropriateness of LTCF initiated AT was 49% (59% after PE and 42% after NE). AE were associated with 3% of AT with allergic reactions and *Clostridioides difficile* infections occurring with 0.4% and 0.7% of AT, respectively. AE were most frequently associated with folate antagonists (5%) and FQ (3%).

Conclusion. This study demonstrates many AU improvement opportunities exist in LTCF and CP can play an important role in identifying them if trained in AS principles. CP should review all AU for appropriateness and provide data to inform AS efforts in LTCF.

Table 1. Antimicrobial Classes Prescribed in Long-Term Care Facilities During 2018

Antimicrobial Class	Number Prescribed (% of Total)
Cephalosporins, All	1295 (24.3)
First-Generation	742 (13.9)
Second-Generation	96 (1.8)
Third-Generation	431 (8.1)
Fourth-Generation	26 (0.5)
Fluoroquinolones	1151 (21.6)
Others	680 (12.8)
Folate Antagonists ¹	507 (9.5)
Urinary Anti-Infectives ²	446 (8.4)
Tetracyclines	371 (7.0)
β -Lactam/ β -Lactamase Inhibitor Combinations	330 (6.2)
Macrolides	214 (4.0)
Penicillins	172 (3.2)
Azole Antifungals	161 (3.0)

1. Folate antagonists include trimethoprim and trimethoprim-sulfamethoxazole
2. Urinary anti-infectives include nitrofurantoin and fosfomicin

Figure 1. Indications for Antimicrobial Therapy Reviewed in Long-Term Care Facilities During 2018

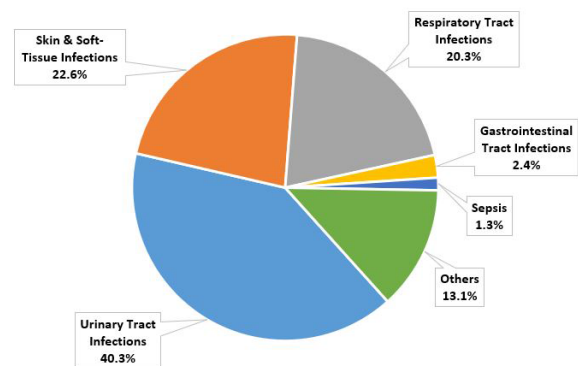
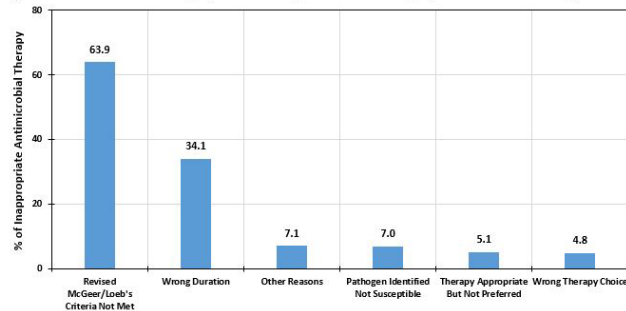


Figure 2. Common Reasons for Inappropriateness among 2158 Courses of Inappropriate Antimicrobial Therapy



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2056. Retrospective Analysis of Intravenous Vancomycin Outcomes in Patients Discharged to Skilled Nursing Facilities

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Background. Patients treated with intravenous (IV) vancomycin at skilled nursing facilities (SNFs) are at increased risk for adverse events.

Methods. Single-center, retrospective chart review to assess specific outcomes of patients receiving IV vancomycin discharged to an SNF from a single institution under the care of infectious diseases (ID) physicians. Population included all patients under the care of an ID provider between November 1, 2017 and October 31, 2018 with GFR > 30 who were discharged to an SNF on IV vancomycin for a minimum of 2 weeks. Patients with chronic kidney disease and patients younger than 18 years old were excluded. It was intended that all patients have weekly labs, including vancomycin troughs, communicated to the ID provider. Outcomes evaluated included complications related to vancomycin therapy, assessment of appropriate trough timing and sub-therapeutic troughs (defined as a trough less than 10), and assessment of communication to the prescribing physician. Complications were defined as vancomycin trough greater than 30, increase in serum creatinine greater than 0.5 above baseline, documented adverse events related to vancomycin, or hospital readmission during antibiotic therapy.

Results. 25 patients who met inclusion criteria were admitted to 14 different SNFs. Osteomyelitis was the most common indication and MRSA was the most commonly isolated organism. 13 of 25 patients experienced the predefined complications; 5 of 25 patients had at least one trough value greater than 30. 13 of 25 patients had troughs drawn at inappropriate times in relation to doses and 15 of 25 patients had either absent or incomplete labs communicated to the prescriber. 4 of 25 patients had at least one trough value less than 10. Only 2 of 25 patients assessed had no complications, troughs appropriately drawn, and lab values communicated to the prescriber.

Conclusion. Patients discharged to SNFs on vancomycin had high rates of complications, low rates of appropriate laboratory monitoring, and poor communication between SNFs and the prescribing ID physician. Vancomycin administration at an SNF warrants careful monitoring for patient safety and demonstrates an area with significant opportunity for improvement.

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2057. Outpatient Antibiotic Stewardship "Bundles up" in Winter with Peer Comparison, URI Order Set and Education: Is It Enough to Weather the Storm?

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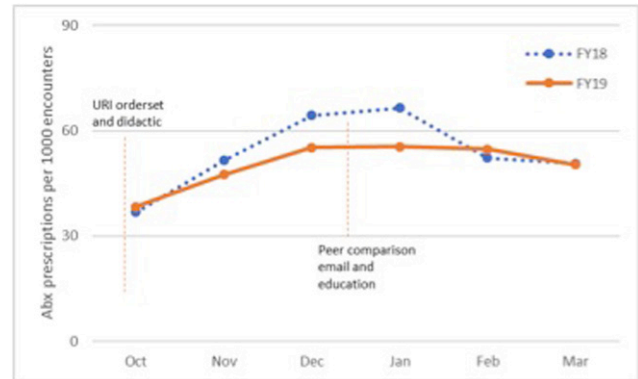
Background. Inappropriate antibiotic use is a growing problem in the outpatient setting. Approximately 90% of all antibiotics are prescribed in outpatient practices. Nonetheless, 30–70% of antibiotic prescriptions (ARx) are unnecessary. Outpatient antimicrobial stewardship (AS) is much needed and the best approach is unknown. We used a bundle approach to outpatient AS during the winter months, by implementing a peer comparison (PC) report, upper respiratory infection (URI) order set and broad education.

Methods. This is a quasi-experimental project during the period October 2018 to March 2019 (FY19) to evaluate the impact of a bundled intervention in primary care clinics at the VA Maryland Health Care System. A historical control group from the same period the previous year (FY18) was used for comparison. The intervention included an AS directed didactic and URI order set followed by an email in 1/2019 with: (1) censored PC report (ARx/1,000 encounters) with outliers defined

as above 1.5 × interquartile range, (2) URI order set reminder, and (3) education. The primary outcome was total ARx per 1,000 encounters in primary care clinics. A random sampling of 200 charts was done to compare proportion of antibiotic appropriateness and number of emergency department (ED) visits and adverse drug events (ADEs) in FY19 Q1 and FY19 Q2. Poisson regression was carried out, in addition to X2-statistic.

Results. There were 3,799 vs. 3,429 ARx in FY18 and FY19, respectively, with a rate difference of 3.3 ARx per 1,000 encounters ($P = 0.0056$). Q1 to Q2 ARx rate increased by 7.8 and 8.0 ARx per 1,000 encounters in FY18 and FY19, respectively. Forty-eight percent (28/58) of the providers confirmed receipt of email. There were 3 and 4 outliers in FY19 Q1 and Q2, respectively. Appropriate ARx for FY19 Q1 and Q2 was found to be 45% and 35% ($P = 0.44$), respectively. The most common indications were URI (18% vs. 18%), urinary tract infection (13% vs. 21%). ED visits (10% vs. 6%) were uncommon and there were no ADEs.

Conclusion. E-mail communication with bundled approach had no effect on ARx or antibiotic appropriateness; however general AS presence and URI order set tempered some use. Removing peer censoring, providing face-to-face education and intensifying antibiotic order sets are additional interventions to be implemented.



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2058. Patient Satisfaction Not Impacted by Antibiotic Prescribing for Viral Upper Respiratory Infections

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Background. Treating viral upper respiratory infections (URI) with antibiotics is a major contributor to the rise of antimicrobial resistance. Major drivers of unnecessary prescribing are a patient's expectation to receive an antibiotic for acute illness and the physician's desire to provide satisfactory care. Our objective was to determine whether receiving an antibiotic prescription for a URI is associated with increased patient satisfaction.

Methods. We identified emergency department (ED) and ambulatory visit (AC) visits with an acute URI diagnosis code between September 2015 and May 2016 that had an associated patient satisfaction survey. The survey queried patients' overall satisfaction ("Overall rating of care received during your visit") using a Likert-type scale ranging from 1 (Very Poor) to 5 (Very Good). We assessed survey responses among patients receiving and not receiving antibiotics using the Wilcoxon rank-sum test. Results from ED and AC visits were compared separately.

Results. We collected survey responses from 282 ED patients and 1306 AC patients with acute URI. Compared with non-recipients, ED respondents receiving an antibiotic were more likely to be female (67% vs. 55%) and on Medicare (28% vs. 21%); AC respondents receiving a prescription were more likely to be female (68% vs. 61%) and have private insurance (63% vs. 53%). Overall satisfaction was very high (Median = 5, IQR 4–5 for both groups). Median responses did not differ by antibiotic prescription status in either group (rank-sum $P = 0.4$ and 0.8 for ED and AC respectively). When dichotomizing the overall satisfaction score, more patients receiving an antibiotic reported satisfaction of good to very good than those not receiving an antibiotic (84% vs. 76%; Pearson's $\chi^2 P = 0.1$) among ED patients, but not AC patients (95% vs. 94%; $P = 0.5$).

Conclusion. Patient satisfaction with their visit was not strongly associated with antibiotic receipt among ED and AC patients with URI in our study. This finding suggests that providers may limit the spread of antibiotic resistance by ceasing to unnecessarily prescribe antibiotics without jeopardizing patient satisfaction. Given low response rates to visit satisfaction surveys, further work is needed to verify the validity of this study and evaluate its generalizability.

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